



SUSTAINING AMERICA'S ARMY
THE STRENGTH OF THE NATION

AMERICA'S ARMY: THE STRENGTH OF THE NATION™



Anti-Corrosion Nanotechnology Solutions for Logistics (ACNS-L)

2009 U.S. Army Corrosion Summit

4 Feb 09; Clearwater, FL

Mr. Ed Scicluna

(703) 805-5337/DSN 655/Edward.Scicluna@us.army.mil

Futures Group, ACNS-L Project Lead

U.S. Army Logistics Innovation Agency

ADAPT // INNOVATE // ANTICIPATE // ALWAYS READY

Report Documentation Page			Form Approved OMB No. 0704-0188		
<p>Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</p>					
1. REPORT DATE 04 FEB 2009	2. REPORT TYPE	3. DATES COVERED 00-00-2009 to 00-00-2009			
4. TITLE AND SUBTITLE Anti-Corrosion Nanotechnology Solutions for Logistics (ACNS-L)			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Logistics Innovation Agency,Futures Group,5870 21st Street, Building 212, Fort Belvoir, VA, 22060-5941			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES 2009 U.S. Army Corrosion Summit, 3-5 Feb, Clearwater Beach, FL					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF: a. REPORT b. ABSTRACT c. THIS PAGE unclassified unclassified unclassified			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 15	19a. NAME OF RESPONSIBLE PERSON



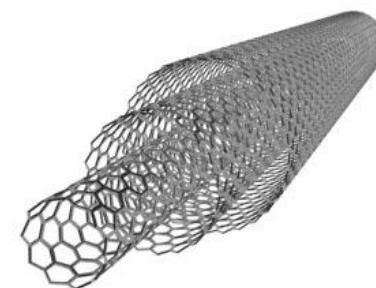
Outline

Project Overview



Source: TC Lin - poagao.com

Objectives



Source: Akasaka

Strategy



Community Engagement



ACNS-L Project Overview

U.S. Army Logistics Innovation Agency (LIA)

- Project Lead: Ed Scicluna (Futures Group)
- Started Aug 08

Goal is to develop...

- A *structured approach to nanotechnology solutions* that will assist *Army future forces to overcome corrosion problems*, and
- A *framework and strategy* for the *application of nano-engineered coatings and/or materials* specifically designed to mitigate corrosion.



Nanotechnology

“Nanotechnology is the understanding and control of matter at dimensions of roughly 1 to 100 nanometers, where unique phenomena enable novel applications”

□ By 2014, impact about 15% of total global output

- \$2.6T manufactured goods will incorporate nanotech
- Army leverage economies of scale

□ Aspects of Nanotechnology

- Manipulation of matter at the nanoscale
- Interdisciplinary
- Unique and enhanced properties

Quantum Dots



Source: Koninklijke Philips Electronics N.V.



ACNS-L Objectives

1. **Increase** U.S. Army awareness about the potential of nanotechnology for corrosive resistant materials.
2. **Identify** current government, academic, industry research and development efforts.
3. **Facilitate** enhanced communication and collaboration through organized information exchange within the Army.
4. **Assess** U.S. Army corrosion mitigation practices and technologies.



ACNS-L Strategy

Phase 1 – Foundational Assessments (2009)

- Nanotechnology Corrosion R&D Assessment
- Army Corrosion Assessment

Phase 2 – Strategy & Logistics (2010)

- Technical/Business Case Analysis/ROI Analysis
- ACNS-L Roadmap

Phase 3 – Testing & Implementation (2011)

- T&E of Nanotechnology Corrosion Solutions
- Subtopic Analysis

Goal → Tangible benefits to Army corrosion mitigation



Nanotech Corrosion R&D

Assessment Report

- ❑ **Identify** key organizations and research groups involved in nanotechnology corrosion mitigation
- ❑ **Summarize** conventional corrosion mitigation techniques and products
- ❑ **Assess** state of nanotech corrosion mitigation R&D
- ❑ **Detail** existing and emerging nanotechnology-enabled commercial products for corrosion mitigation
- ❑ **Report** on major areas of nanotech corrosion mitigation



Army Corrosion Mitigation

Assessment Report

- **Identify** current Army-funded nanotech corrosion RDT&E activities
- **Summarize** current Army corrosion mitigation practices
- **Assess** Army corrosion mitigation practices and technology across vehicles, facilities, varying conditions/environments
- **Provide** tradeoff analyses of nanotech products and technologies
- **Recommend** possible U.S. Army applications



Platforms of Interest

Initial List

- Age of Platform
- Commonality with other Services
- Widespread Use
- Harsh Operating Environments

Wheeled Vehicles

- Heavy Expanded Mobility Tactical Truck (HEMTT)
- High-Mobility Multipurpose Wheeled Vehicle (HMMWV)
- M900 Series of 5 Ton Trucks
- Family of Medium Tactical Vehicles
- M1070 Heavy Equipment Transporter
- Tactical Wheeled Vehicle
- Logistics Materials Handling Equipment

Tracked Vehicles

- M1A2 Abrams
- Engineering Vehicles

Aviation

- UH-60 Black Hawk
- CH-47 Chinook

Small Arms

- MK-19 Grenade MG
- M2 Browning MG

Other

- Generator & Powers Sets
- Support and Ground Handling Equipment
- Army Watercraft

***Candidates for
Phase 2 Detailed Analysis***



Project Tasks

- ❑ **Engage** Army corrosion stakeholders continuously
 - Improve relevance of analysis, Align with requirements
- ❑ **Capitalize** on existing investments
 - Prevent redundant efforts
- ❑ **Expand** nanotech corrosion mitigation knowledge base
 - Extend/update level of detail, Fill gaps
- ❑ **Provide** foundational assessments
 - Stepping stone to realizing Army applications



Army & DoD Stakeholders

- Incorporate CPC activities into analysis reports
- Align future phases with requirements / needs
- Topics of Interest:
 - Top 10 corrosion issues?
 - Current CPC practices and technologies?
 - Nanotech corrosion products or R&D?



Available During Conference



Industry & Academia

- Incorporate R&D and products into analyses
- Evaluate for roadmap and Army applications
- Topics of Interest:

- Commercial maturity?
- Benefits of nano?
- Comparison to conventional technologies?
- Proposed applications?



Source: Industrial Nanotech, Inc.

Available During Conference



Collaboration & Information Resources

- **CorrDefense** (www.corrdefense.org)
 - “*Nanotechnology Corrosion Solutions*” WG
 - Information on nanotechnology research and products for corrosion mitigation
- **NanoLog e-Portal** (www.nanolog.org)
 - General site for nanotechnology and DoD logistics





Conclusion

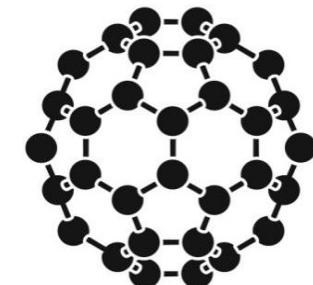
Anti-Corrosion Nanotechnology Solutions – Logistics (ACNS-L)

USA LIA Project

Leveraging nanotech to fight Army corrosion

- Nanotech Corrosion R&D Assessment
- Army Corrosion Mitigation Assessment

Actively engaging stakeholders and the R&D community



Source: ManTech e-IC



Source: Darren Hester (Flickr)



THANK YOU

ANTICIPATE

INNOVATE

ADAPT

ALWAYS READY

UNCLASSIFIED: AUTHORIZED FOR PUBLIC RELEASE